

UNITED STATES NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

AUG 2 4 1993

Docket: 70-398

MEMORANDUM FOR: Robert Pierson, Chief Licensing Branch Division of Fuel Cycle Safety and Safeguards, NMSS

THRU: Michael Tokar, Section Leader Licensing Section 2 Licensing Branch Division of Fuel Cycle Safety and Safeguards, NMSS

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FROM: Mary Adams Licensing Section 2 Licensing Branch

SUBJECT:

TRIP REPORT, MASSACHUSETTS INSTITUTE OF TECHNOLOGY (MIT), JULY 1-2, 1993

The purpose of this trip was to acquaint the project manager with the facilities licensed to possess special nuclear material under License SNM-986 and to discuss renewal of the license with MIT staff.

Division of Fuel Cycle Safety and Safequards, NMSS

I met Mitch Galanek of the Campus Radiation Protection Office at 9:30 am Thursday to plan the visit and to make appointments with Radiation Protection staff at the MIT reactor site, the Plasma Fusion Center, and the Bates Linear Accelerator. The Lincoln Laboratory was not included in this visit because SNM has not been used or stored there for several years.

The Reactor Radiation Protection Officer is Fred McWilliams, and the Accelerator RPO is Gerald Fallon. Dr. Catherine Fiore is the head of the Plasma Fusion Center, Office of Environmental Health and Safety.

I visited the Research Reactor and met Fred McWilliams and Tom Newton, the Superintendent of Reactor Engineering. The MIT reactor is used for medical research and therapy. The current project is treatment of brain cancers (glialblastoma) by irradiation of the tumor after the patient has been treated with a drug that concentrates boron in the tumor. This boron neutron capture therapy (BNCT) research will be performed by the New England Medical Center, Tufts University, using the MIT reactor, and is expected to start in September this year.

Spent reactor fuel is stored in a pool until it is returned to the Savannah River Plant. The pool contained three assemblies.

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SNM at the reactor, which includes fission chambers and unirradiated reactor fuel, is stored in a locked vault (NW12-103) inside the reactor building. Fuel rods are stored in racks in the wall of this vault, in long thin trays separated by 12 inch spacing. SNM can also be stored in vault NW12-105A and in the Hot Plug Storage Area. Neither contained any licensed material at the time of the visit. The Hot Plug Storage Area can be used for fission chamber and other SNM storage. This storage area contains about 24 (3 rows of 8) horizontal tubes of varying lengths (6'-12') and diameters (8"-24") that extend from the reactor containment area into an earth-filled space. Pu-Be neutron sources were stored in their containers in a locked steel cage within the reactor building. The reactor building also has a hot cell and a shielded hood where SNM can be used or stored; these did not contain any SNM at the time of the visit.

The current license allows possession of eight Pu-Be neutron sources and identifies them by serial number. MIT still has the same eight Pu-Be sources. Most of them are kept at the reactor building, two are at the Bates Accelerator, and one is stored in the Central Radioisotope Facility.

The Director of Reactor Operations is John Bernard. The Superintendent of Reactor Operations is Ed Lau. Mr. Bernard is a member and serves as Secretary of the Reactor Safeguards Committee.

There are five Geiger-Mueller counters on the MIT campus surrounding the reactor. I visited one monitor on top of the Green Building.

The Plasma Fusion Center (PFC) is a new facility on the MIT campus. The PFC will have 12 fission detectors in place when it is in operation. Six have been installed, six new detectors have not been installed yet. These contain 93 percent enriched uranium from Lawrence Livermore Laboratory. I suggested that the safety staff of the PFC be added to the license application. Mr. Massé stated that he would prefer not to add them because they are employees of the PFC, not the Radiation Protection Office. He also believes that the PFC is covered by the existing license under the "MIT campus" umbrella.

Argonne National Laboratory has a number of 19.99 percent-enriched irradiated fuel plates that MIT wants to acquire. MIT may want to add them to the SNM license or the reactor license. The fuel plates are sheets about 40 inches square, and MIT needs about 10 of them. Their activity will be changing over time. They will be used for a second medical treatment room associated with the reactor. The plates will be bombarded with neutrons from the reactor thermal column to produce high energy neutrons for the medical facility. MIT will apply for a license amendment to possess them. I suggested that they not wait for the license to be renewed, but that Mr. Massé apply for an amendment to the current license in addition to the pending renewal application.

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With respect to financial assurance, MIT plans to self-insure under the proposed rule that allows entities worth more than \$1 billion to self-insure.

Mr. Massé would like to divideO SNM-986 into two licenses, a Part 70 license for enriched materials and a Part 40 license for the natural and depleted uranium currently authorized under the Part 70 license. The current license combines these materials under SNM-986. I suggested that it may be necessary to amend SNM-986 to remove the natural and depleted uranium and apply for a new Part 40 license. MIT would also like to remove the requirement for annual training of technicians. This would also require a license amendment.

At the Bates Linear Accelerator, MIT has one $Pu-\alpha$ check source and two Pu-Be neutron sources stored in a locked cabinet. They are used to calibrate counters and TLDs.

I informed Mr. Massé that I planned to transmit a request for additional information to update the renewal application to reflect current operations.

ORIGINAL SIGNED BY

Mary Adams Licensing Section 2 Licensing Branch Division of Fuel Cycle Safety and Safeguards, NMSS

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